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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/708,175

02/13/2004

Wen-Yuan Yeh

11836-US-PA

2174

31561

7590

03/18/2005

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE

7 FLOOR-1, NO. 100

ROOSEVELT ROAD, SECTION 2

TAIPEI, 100

TAIWAN

EXAMINER

CHEN, JACK S J

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/708,175		YEH, WEN-YUAN	
	Examiner		Art Unit	
	Jack Chen		2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,8-10,21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

In response to the communication filed on January 12, 2005, claims 1-2, 8-10 and 21-22 are active in this application.

The amended claims 8-10 and the newly submitted claim 21 directed to an invention that is independent or distinct from the invention originally claimed/elected for the following reasons: forming the gate stack with the metal silicide, see office action dated on 7/6/04 and the applicant's election dated on 8/4/04.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 8-10 and 21 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo, U.S. Pub. No. 2004/0000695 A1 taken with Yao et al., U.S./6,455,330 B1 and in view of Gerritsen et al., U.S./6,281,556 B1.

Matsuo discloses a method for forming a semiconductor device, which comprises providing a substrate 100 (fig. 1A); forming a gate dielectric layer 102 over the substrate (fig. 1A); forming an indium doped polysilicon layer 106 over the gate dielectric layer (fig. 1B); patterning the indium doped polysilicon layer and the gate dielectric layer to form a gate 110 (fig. 2A); and forming an N-doped region 114a/114b in the substrate on each side of the gate (fig. 2B), see figs. 1A-8C; pages 1-11 for more details.

Matsuo disclosed above; however, Matsuo is silent to using in-situ doping method for forming the indium doped polysilicon layer.

Yao et al. teach a method for forming a semiconductor device, which comprises forming the indium doped polysilicon layer by performing an in-situ indium ion doping during a chemical vapor deposition operation (col. 8, lines 5-25) or by ion implantation, see figs. 1-4; cols. 1-10 for more details.

Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to use either in-situ doping method or ion implantation method to incorporate indium into the polysilicon as taught by Yao et al. in the method of Matsuo in order to lower the sheet resistance of the gate.

The further difference between the instant claims and the above prior art are as following: the above prior art is silent to using indium chloride as the dopant source for indium.

Gerritsen et al. teach a method for forming a semiconductor device, which comprises using gaseous indium chloride (col. 3, lines 5-21) as the dopant source for indium (i.e., the gaseous indium chloride is formed by heating the solid indium chloride to about 320 C), see figs. 1a-8 and cols. 1-8 for more details. In addition, using the indium chloride as the source for

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indium has been known in the art. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). "Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig - saw puzzle." 65 USPQ at 301.).

Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to use any suitable dopant source for indium as taught by Gerritsen et al. in the method of Matsuo and Yao et al. in order to incorporate indium into the polysilicon such will improve the performance of the device.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Gerritsen et al. by selecting the suitable temperature, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In *re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Response to Arguments

3. Applicant's arguments filed January 12, 2005 have been fully considered but they are not persuasive.

Applicant argues that none of the prior art shows forming the indium doped polysilicon layer by performing an in-situ indium ion doping during a chemical vapor deposition operation. The examiner disagrees because col. 8, lines 5-25 of Yao et al. shows such feature, specially lines 21-23.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Chen whose telephone number is (571)272-1689. The examiner can normally be reached on Monday-Friday (9:00am-6:30pm) alternate Monday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead can be reached on (571)272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jack Chen
Primary Examiner
Art Unit 2813

March 16, 2005